

نام خانوادگی: علی رابین دد ماسم تعالی «
کتاب شماره: ۲۵ کلاس یازم A

$$f(x) = \left(\frac{1}{x}\right)^{x-1} - 1$$

$$f(x+1) = \left(\frac{1}{x+1}\right)^{x+1-1} - 1 = \left(\frac{1}{x+1}\right)^x - 1$$

$$D_f = [0, 1]$$

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$$f(x) = \sqrt{x-1} \quad f(x) = \sqrt{-x+1}$$

$$D_f = (-\infty, 1]$$

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$$y = \sqrt{\frac{x-1}{f(x)}} \rightarrow f(x) \neq 0 \Rightarrow x \neq \{-1, 2, 4\}$$

$$D_f = (-1, 1] \cup (2, 4)$$

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$$y_1 = \frac{1}{9x^2 - 7x^2 - 4x - 1} \quad y_2 = \frac{1}{x^2x^2 + 6x + 1}$$

$$9x^2 - 7x^2 - 4x - 1 = 9x^2 - 7x^2 - 2x^2 - 4x - 1 = -(2x^2 + 4x + 1) = -(2x+1)^2$$

$$x^2x^2 + 6x + 1 = x^4 + 6x + 1$$

$$\Delta < 0 \rightarrow \sqrt{-(a+b)} = \sqrt{-(-1)} = 1$$

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$$f(x) = x^2 + 2$$

$$D_f = [-1, 0) \cup [2, +\infty)$$

$$y = \sqrt{f(x) - f\left(\frac{x}{2}\right)}$$

$$y = \sqrt{x^2 + 2 - \left(\frac{x}{2}\right)^2 - 2} = \sqrt{x^2 - \frac{x^2}{4}} = \sqrt{\frac{3x^2}{4}}$$

$$x^2 + 2 - \left(\frac{x}{2}\right)^2 - 2 \geq 0 \Rightarrow x^2 - \frac{x^2}{4} \geq 0 \Rightarrow \frac{3x^2}{4} \geq 0$$

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$$f(x^2+2) = x^2-1$$

$$V+1 = \boxed{\Lambda} \checkmark$$

$$\textcircled{2} \quad \Lambda - 2$$

$$f(x) = f(x+1) = x-1 = \boxed{1}$$

$$f(10) = f(x^2+2) = x^2-1 = \boxed{9}$$

$$g(x) = x^2 + 9x^2 + 4Vx + 4V - 2V$$

$$(x+2)^2 - 4V$$

$$\textcircled{2V+V}$$

$$f(x) = x^2 - 4x^2 + 12x + \Lambda - \Lambda$$

$$(x-2)^2 + \Lambda$$

$$\textcircled{2} - V$$

$$\frac{g(\sqrt{V}-2)}{f(\sqrt{V}+2)} = \frac{(\sqrt{V}-2)^2 - 4V}{(\sqrt{V}+2)^2 + \Lambda} = \frac{-2}{1} = \boxed{-2} \checkmark$$

$$x \geq 2$$

$$g(x) = \sqrt{x-2} \sqrt{x-2} \quad , \quad f(x) = \sqrt{x+2} \sqrt{x-2}$$

$$\textcircled{2} - \Lambda$$

$$(\sqrt{x-2} \sqrt{x-2} + \sqrt{x+2} \sqrt{x-2})^2 = x-2 + 2\sqrt{x-2} \sqrt{x+2} \sqrt{x-2} + x+2 + \sqrt{x+2} \sqrt{x-2}$$

$$= 2x + 2\sqrt{x^2 - (2\sqrt{x-2})^2} = 2\sqrt{x^2 - 4x + 4} = 2\sqrt{x^2 - 4x + 4} = 2\sqrt{(x-2)^2} = 2(x-2) = 2x-4$$

$$= (2x-4)^2 = 4x^2 - 16x + 16 \Rightarrow a = \sqrt{4x^2 - 16x + 16} = 2\sqrt{x-2} \quad \frac{a+b}{c} = \frac{2}{-2} = \boxed{-1} \checkmark$$

$$g(x) = \{(x,1)(1,0)(-1,0)(0,1)\} \quad f(x) = \frac{x+2}{x^2-4x+3}$$

$$\textcircled{2} - 9$$

$$f(x) = \{(x,-1)(1,0)(-1,0)(0,1)\}$$

$$\frac{g}{f} = \frac{1}{-1} \quad , \quad \frac{f}{g} = 1 \Rightarrow \boxed{-1, 1} \Rightarrow \{(0,1)(1,-1)\} \checkmark$$

$$1) f(2) = \left\{ \left(\frac{1}{2}, 2 \right) \left(\frac{2}{2}, -1 \right) (2, 2) \left(-\frac{1}{2}, 2 \right) \right\} \checkmark \quad \textcircled{2} \quad f(x) = \{(1,2)(2,-1)(-1,2)\} = 10$$

$$2) f(3) = \left\{ (\pm 1, 3) (\pm \sqrt{2}, -1) (\pm 2, 3) \left(-\frac{1}{\sqrt{2}}, 3 \right) \right\} \checkmark \quad \text{در ادامه این تابع تعریف نمیشود}$$

$$3) 2g^2(x) = 2 \quad g^2 = \{(x,9)(1,0)(2,4)(-1,0)\} \quad \checkmark \Rightarrow \{(-2,18)(1,3)(2,9)(-1,0)\} = 1$$

$$4) = \frac{2f}{g} = \left\{ \left(1, \frac{2}{1} \right) \left(-1, \frac{2}{-1} \right) \left(2, \frac{2}{2} \right) \right\} = \{(1,2)(-1,-2)(2,1)\} \checkmark$$